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Comments:

From the SCS Chief

The plant materials program of the Soil Conservation Service provides a storehouse of plants with which our field people can help farmers, ranchers, and others fight erosion and protect water quality. Vegetation is a major part of more than two-thirds of the conservation practices SCS recommends to land users. SCS-released conservation plants are suited to specific soil and climatic conditions and are recommended for solving specific resource problems.

At the 23 plant materials centers (PMC's) around the country, SCS plant materials specialists in 1980 evaluated nearly 20,000 different plant collections for conservation uses. More than 2,000 of these collections were selected for field evaluation under controlled conditions, and the most promising plants are now being evaluated in 3,285 field plantings under actual use conditions. Other Federal agencies; State experiment stations; State highway agencies; State departments of natural resources, conservation, and wildlife; and conservation district cooperators assist with the field evaluations and field plantings.

In 1980, the National PMC at Beltsville, Md., introduced 5,700 plant accessions into the United States from 28 different foreign countries. Plant specialists at PMC's around the country evaluate these plants for their potential use in conservation programs in the United States. The National PMC also shipped 381 accessions of U.S. conservation plants to 30 foreign countries.

SCS plant materials specialists evaluate foreign and native plants for their suitability for improving rangeland; reclaiming surface mined land; controlling erosion at construction sites, along roadsides, and on shorelines and streambanks; and providing windbreaks, winter cover on cropland, permanent sod for no-till row crops, and food and cover for wildlife.

In 1980, the retail value to the seed and plant industry from the commercial production of SCS-released plant varieties was more than $19.5 million. Provided the plants were used at the SCS recommended seeding or planting rate, they would have treated 1.6 million acres. Currently, seed growers and nursery-owners are commercially producing more than 150 SCS-released varieties including such well-known plants as 'Cape' American beachgrass, 'Emerald' crownvetch, 'Critana' thickspike wheatgrass, and three cultivars of limpograss.

Cover: Keith Salvo, manager of the Soil Conservation Service's National Plant Materials Center (PMC) in Beltsville, Md., examines a seedling of smooth cordgrass for root growth. The National PMC is one of 23 around the country that evaluate domestic and foreign plants for conservation uses. (Photo, Tim McCabe, photographer, Information and Public Affairs, SCS, Washington, D.C.)

John R. Block
Secretary of Agriculture

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RCA Update

In early November, the U.S. Department of Agriculture (USDA) distributed for public comment the Revised Draft 1981 Program Report and Environmental Impact Statement of the Soil and Water Resources Conservation Act of 1977 (RCA). USDA's preferred program is based on greater cooperation among local and State governments and the Federal Government.

The program addresses specific national resource priorities and targets soil and water conservation activities to the worst problems first. As an inducement to increased conservation involvement by local and State governments, USDA will offer matching block grants to those States that augment their soil and water conservation activities.

Local governments will be encouraged to establish conservation coordinating boards made up of representatives of the conservation district, the county agricultural stabilization and conservation committee, the extension advisory committee, and other interested parties. These boards will identify critical resource problems of local significance and set local priorities. Each Governor will be encouraged to appoint members of a State conservation coordinating board to identify statewide critical resource problems and develop a State program. The Secretary of Agriculture will appoint a national conservation board after considering the candidates the Governors recommend. This board will advise the Secretary on conservation matters.

The revised draft program report supersedes an earlier report, which drew over 65,000 responses from almost 120,000 people across the Nation. Most of the earlier comments were directed toward proposed USDA conservation objectives and alternative strategies for developing soil and water conservation programs.

In anticipation of extensive response, the USDA distributed 30,000 copies of the revised draft program report and 400,000 copies of a summary leaflet and attached response form. Potential respondents have been asked to mail their comments to the appropriate Soil Conservation Service State office by January 15, 1982.

The public comments will be tabulated and analyzed. They will be used in preparing a final program report. The current schedule calls for the President to submit the final RCA program report to Congress next spring.

Documentation of the RCA appraisal and analysis of current and projected resource needs, which provide the basis for the program proposals, are contained in the 1980 RCA Appraisal, Parts I and II, which were published in August 1981. These documents have been placed in each field office of the Soil Conservation Service, and they are available to the public for reference.

James N. Benson,
writer-editor, Planning and Evaluation, SCS, Washington, D.C.

Plant Materials at Work

SCS Releases 10 New Conservation Plants

From 1975 to 1980, Soil Conservation Service plant materials centers (PMC's), in cooperation with other Federal and State agencies, released 64 conservation plants to commercial seed producers and nurseries for distribution to farmers, ranchers, and other land managers. By October 1981, the PMC's had released another 10 plants. Three of them were released this past spring: 'Hederma' sickle-keeled lupine; 'Lometa' indiangrass; and 'Verde' kleingrass. Another three were released this past summer: 'Saltalk' alkali sacaton, 'Atlantic' coastal panicgrass, and 'Berber' orchardgrass. The last four were released this past fall: 'Yellow Puff' littleleaf leadtree, 'Rainbow' wild plum, 'T-587' old world bluestem, and 'Aroostook' rye.

'Hederma' sickle-keeled lupine is a native legume used for controlling erosion on logging roads, cut-over woodland, highway slopes, dredge spoils, and other disturbed areas, and for improving wildlife habitat in western Washington and Oregon and northwest California. It was released by the PMC in Corvallis, Oreg.

'Lometa' indiangrass was developed from a native collection for use in central and south Texas, and possibly outside the State. 'Verde' kleingrass was selected for its increased seed size and improved seedling vigor as an improved wildlife and livestock food species. It is also expected to be more easily established than other available cultivars for forage and wildlife plantings. USDA's Agricultural Research Service (ARS) and the Texas Agricultural Experiment Station cooperated in the release of 'Lometa' indiangrass and 'Verde' kleingrass from the Knox City, Tex., PMC.

'Saltalk' alkali sacaton is a native grass suited for use in critical area treatment of saline-alkali affected areas and for reseeding in the Southern Great Plains. ARS and the agricultural experiment stations in Oklahoma and Texas cooperated in its release.

'Atlantic' coastal panicgrass, another native grass, is used for stabilizing disturbed sites such as gravel mines and infertile sandy soils in the Coastal Plain and Piedmont area from Massachusetts to Texas. It was released in cooperation with the New Jersey Agricultural Experiment Station.

'Berber' orchardgrass is used for stabilizing critically eroding areas and for producing dryland range forage in the Mediterranean climate areas of California. The California Agricultural Experiment Station cooperated in its release.

Three of the plants released in the fall of 1981 were developed in cooperation with the Texas Agricultural Experiment Station: 'Yellow Puff' littleleaf leadtree, 'Rainbow' wild plum, and 'T-587' old world bluestem. The Abilene State School of the Texas Department of Mental Health and Mental Retardation also cooperated in the development of 'Yellow Puff' littleleaf leadtree, and the Texas Forest Service cooperated in the development of 'Rainbow' wild plum.

'Yellow Puff' littleleaf leadtree is a native leguminous shrub or small tree suited to central and west Texas on dry, well-drained, rocky soils. It is a high quality shrub readily browsed by wildlife and livestock.

'Rainbow' wild plum, a native perennial fruit-bearing shrub or small tree, provides erosion control and plant diversity in the reclamation of surface mined land. It is also an excellent plant for use by wildlife and for beautification. It is adapted throughout Texas and southern Oklahoma on well-drained to sandy loam soils.

'T-587' old world bluestem is a perennial, warm-season grass. It is a high forage producer and very persistent under heavy grazing and widely adapted to the diverse climate and soils of Texas. Besides its adaptation as a pasture or range grass, it is very useful in stabilizing critically eroding areas.

'Aroostook' rye, an excellent cover crop for cold soils, was developed in cooperation with the Maine Agricultural Experiment Station and the State of Maine Division of Plant Industry. 'Aroostook' was developed specifically for seeding after late harvested crops like potatoes, cabbage, or silage corn. It establishes well in the fall and provides horizontal growth for good ground cover.

Nancy M. Garlitz,
associate editor, *Soil and Water Conservation News*, SCS, Washington, D.C.

Tryouts Being Held in Florida for Plants to Curb Shoreline Erosion

Every year when destructive storms assault Florida's coastline, churning waters tear away tons of sand. To curb this shoreline erosion in Martin County, the Soil Conservation Service, the Martin County Soil and Water Conservation District, and the U.S. Army Corps of Engineers set up a demonstration project for the Stuart and Jensen Beach causeways. The causeways cross the tidally influenced Indian River, serving as the only links between the mainland and the barrier island.

The project is one of the demonstrations authorized by the Shoreline Erosion Control Demonstration Act of 1974 (Public Law 93-251). This act also created the Shoreline Erosion Advisory Panel to advise and assist the Corps of Engineers in selecting sites and in carrying out the demonstration program. Under the demonstration project, a variety of erosion control measures have been installed, such as revetments in combination with vegetation, vegetation without protection, and vegetation with a tire breakwater reef to provide temporary protection.

SCS had responsibility for the vegetation part of the project under the leadership of Don Smith, SCS plant materials specialist; Allan Connell, SCS district conservationist; and Bob Craig, SCS resource conservationist for Florida. The planting crew spent 8 days planting salt-tolerant plants such as smooth and saltmeadow cordgrass; red, white, and black mangroves; seashore paspalum; silverthorn; and seagrapes. The plants were provided by the SCS plant materials center in Brooksville, Fla., and some commercial growers. Approximately 14,000 plants were planted along 1,300 feet of shoreline in June 1979 in anticipation of summer rains.

"Unfortunately, just as the plants were beginning to take hold, Hurricane David roared through the area destroying much of the initial plantings and the tire reef," said Smith. Replanting was inevitable and the SCS crew was back at it, repairing the gaping holes left by David.

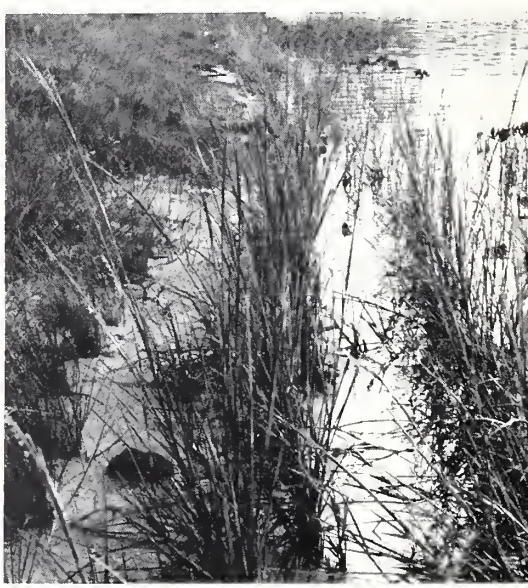
Additional plantings of seashore paspalum were made in May 1980; 1,200 potted plants were used to supplement the original plantings.

"The project is showing great signs of success," said Connell. "The seashore paspalum has completely covered the shoreline, and the cordgrass is more than 4 feet tall. It looks like a hayfield."

Connell hopes that demonstration projects such as this will help show coastal landowners in Martin County the value of native vegetation as a means of controlling erosion.

Evaluations of the project continue with plans to release some of the more desirable species of plants commercially.

Fred Merrill,
retired public information officer,
SCS, Gainesville, Fla.



At left, the problem—Australian pine roots are exposed by waves eating away the beach. At right, the solution—smooth cordgrass gets a foothold in trial planting of tidal areas.

Holding the Sand in Place on Dauphin Island

For years sand had been encroaching onto Dauphin Island, Ala., a 15-mile-long island in the Gulf of Mexico at the mouth of Mobile Bay. Topographic maps and aerial photos showed that sand had encroached as much as 175 feet in 45 years. One lot had sand piled 35 feet high, and sand dunes had covered nearly 150 feet of roads.

"The school board had been hauling sand from the school grounds in dump trucks and was barely keeping ahead," said Huey Kirk, a Dauphin Island landowner.

Three years ago, Kirk began working with a group of people on a project to stabilize the sand dunes on Dauphin Island. The group includes Jackie Shoning, president of the Dauphin Island Property Owners Association; Joe Ruffer, Mobile County engineer; the Mobile County Soil and Water Conservation District (SWCD); and Grant Mattox, Soil Conservation Service district conservationist.

"In the 1940's, Dauphin Island was one of the nicest beaches in this area," said Kirk. "One of the problems has been that no one had a personal interest in protecting the beach."

Shoning, who has worked with the property owners association for the past 5 years and as its president for the past 3 years, concurred. "It is difficult to interest people in a project to stabilize sand dunes," she said. "Many are here as tourists just for a day and don't realize the problem."

The group agreed to set up experimental plots of vegetation to stabilize the sand dunes and serve as a demonstration project to show Dauphin Island landowners what can be done. The plots were located on grounds owned by the Dauphin Island Park and Beach Board. The Mobile County Commission shared in some of the costs and the Mobile County SWCD obtained seed from an SCS plant materials center.

Twenty acres of coastal panicgrass were planted using seeding rates of 20 pounds per acre. Fertilizer was applied by airplane at 400 pounds of 13–13–13 per acre. Besides fertilizing the coastal panicgrass, the fertilizer increased the growth of seacoast bluestem and other native vegetation on 10 acres. The County Commission provided the fertilizer for $800 the first year, $1,000 the second year, and $1,200 the third year.

Sand fences were built near the school to stop the encroaching sand so that sand dunes would form and vegetation could be established. Ruffer hopes that individual property owners will follow the group's lead and install fences themselves.

"Sand fences cost from 50 to 75 cents per foot and are reusable," Ruffer said. "Most property owners have a 70-foot waterfront and could install a fence for less than $100.

"Dunes are important for flood insurance," he continued. "They protect the island from wind and water action and the encroaching sand."

About 800 permanent residents live on the island. Before Hurricane Frederic hit on September 12, 1979, there were nearly twice that many. Frederic destroyed the bridge leading to the island and since then access to the island has been limited to boats, airplanes, or ferry.

Hurricane Frederic also destroyed almost 50 percent of the vegetative cover established by the group. But Kirk says that the project has still been worthwhile. "The school board no longer has to haul sand from the school grounds, vegetation is establishing, and sand dunes are forming," he said.

Ruffer estimates that more than $7,000 has been spent on fertilizer and sand fences and that more than $10,000 worth of labor and equipment has been donated.

Huey Kirk sows false anil indigo seed to help stabilize sand movement on Dauphin Island.

In May 1980, ½ acre of the legume false anil indigo was planted, but the plants have not germinated yet due to a lack of rainfall.

The group plans to maintain the established vegetation and to continue to search for better plants to do the job. They hope that the residents and other property owners of Dauphin Island will join them in making sure the island will continue to be an attractive area for residents and tourists alike.

Morris S. Gillespie,
public information officer, SCS, Auburn, Ala.

Shrubs and Grasses Save Soil and Crops on Irrigated Fields

The Adams County Soil and Water Conservation District (SWCD) in Wisconsin is renting land for the State's first field trial of windbreaks and vegetative row barriers on center-pivot irrigated fields.

In April 1979, in cooperation with the SWCD, the Soil Conservation Service planted 8 strips of perennial grasses and 8 strips of shrubs spaced at planned intervals across a 160-acre, center-pivot irrigated field in the central sands area of Wisconsin.

The grasses, some planted more than one per strip, are: prairie cordgrass, prairie sandreed, common reed, 'Cave-In-Rock' switchgrass, 'Kanlow' switchgrass, 'Blackwell' switchgrass, and 'Jose' tall wheatgrass. The shrubs are: Peking cotoneaster, 'Roselow' Sargent crab apple, silky dogwood, highbush cranberry, European buckthorn, Siberian peashrub, Amur privet, and white bell honeysuckle.

SCS planted the grasses in strips 6 feet wide and 108 feet apart, but planted the shrubs in strips 15 feet wide and 219 feet apart. The shrub strips can be spaced farther apart because they grow taller than the grasses and protect more cropland. The grasses grow 4 to 5 feet tall; the shrubs may reach more than 10 feet tall.

Stan Thomas, manager for a midwestern farm company, operates 3,500 acres of farmland and charges the conservation district one-half the normal yearly rental for the strips of land that total 10 acres. Thomas reduces the rent 20 percent every year so by 1985 he will not be charging any rent.

Thomas also donated the four corners of the 160-acre field, the land that the irrigation pipe misses as it circles the square field. In these corners, SCS planted grasses, legumes, and deciduous and evergreen shrubs and trees for windbreaks and wildlife habitat improvement.

Thomas already had red pine and hybrid aspen trees as windbreaks bordering the four sides of the field.

SCS is trying to find grasses and shrubs it can recommend to replace the trees farmers in the central sands area are removing from windbreaks on cropland and woodlands to create 160-acre tracts of land that can be watered by 1,320-foot-long center-pivot irrigation pipes. The pipes roll on 10-foot-high motorized towers, circling ground water pumps.

By removing these trees, the farmers are exposing the sandy soils to winds which are blowing away an average 8 tons of soil per acre per year. Currently, there are 35,000 acres of cropland being irrigated in Adams County, mostly by center-pivot irrigation.

By 1985, when the shrubs and grasses in this field trial are mature, the loss of windblown soil on the planted areas should drop from 8 tons per acre per year to about 2 tons per acre per year. Farmers can reduce this loss further by planting the rows of shrubs and grasses closer together.

Of the major crops grown in the central sands area—cucumbers, carrots, peas, snap beans, soybeans, potatoes, and corn—only corn can withstand even 2 tons of windblown soil per acre per year without damage from sandblasting.

The most promising plants in the field trial are 'Jose' tall wheatgrass and white bell honeysuckle even though all three varieties of switchgrass have established stands thick enough to interrupt the wind. Most of the shrubs have established good stands, white bell honeysuckle growing the fastest. Grasses showing the poorest performance to date include prairie cordgrass, prairie sandreed, common reed, and perennial grain.

SCS will replant or replace the grasses that have failed. A new variety of winter rye, 'Aroostook,' may be evaluated too. SCS will also replace any shrubs that fail to provide adequate wind protection.

Many Adams County SWCD supervisors expect this field trial will demonstrate that farmers can save money by using recommended grasses and shrubs to protect their center-pivot irrigated vegetables from winds. Winds lower crop yields by damaging plants and removing the soil along with organic matter, fertilizers, and pesticides.

Keith H. Widdel,
district conservationist, SCS, Friendship, Wis.

Native Grasses Fight the Waves on Tidal Shorelines

The Soil Conservation Service's plant materials center (PMC) at Cape May Court House, N.J., has been evaluating three native grass species for stabilizing tidal shorelines. The grasses are smooth cordgrass (*Spartina alterniflora*), saltmeadow cordgrass (*Spartina patens*), and American beachgrass (*Ammophila breviligulata*).

Plant materials staff at the PMC, working with other specialists from SCS, conservation districts, and the Virginia State Soil and Water Commission, are testing the plants along severely eroding tidal coastlines in North Carolina, Virginia, Maryland, Delaware, and southern New Jersey.

The objective of the PMC evaluations is to develop and release to commercial growers superior varieties of smooth cordgrass and saltmeadow cordgrass for stabilizing tidal shorelines and to define those site characteristics that affect vegetation performance on eroding tidal banks.

Smooth cordgrass is adapted to the intertidal zone, the area between high and low tides. It provides initial protection on the beach against incoming waves. Beginning in 1977, the Cape May PMC collected 100 strains along coastlines from Massachusetts to Texas. These plants were replanted at the PMC in a specially constructed tidal basin to determine winter hardiness. From this group, 40 promising strains were selected to be planted on a tidal shore in Maryland where they are now being observed to determine how effectively each variety performs under actual conditions.

Saltmeadow cordgrass grows above the high tide mark and protects the bank or upper beach during storms and abnormally high tides. In 1975, the Cape May PMC collected 75 strains and brought them to the PMC for evaluation. Several strains were selected for additional testing. From these tests, six selections have been made for evaluation on problem tidal sites.

The PMC began testing strains of American beachgrass in the 1960's, and in 1972 released 'Cape' American beachgrass to commercial growers because it had proved superior in stabilizing sand dunes. In subsequent testing, American beachgrass has demonstrated adaptation at elevations above the saltmeadow cordgrass zones especially on sloping banks where the soil is unstable.

In its evaluations, the PMC studies both the top growth that breaks up wave action during normal storm tides and the root mass that will regenerate top growth that is damaged or destroyed by storm events or people. While the PMC is evaluating the plants for erosion control, it is also studying site selection and planting techniques, including comparing potted and bare-root planting stock, soluble and slow-release fertilizers, and plant spacings.

The PMC is studying tidal shoreline characteristics that affect vegetation performance on tidal banks. These characteristics include:

- Fetch, the distance along open water or land over which the wind blows without obstruction;
- Shape of shoreline;
- Shoreline orientation;
- Boat traffic;
- Width of beach above high tide;
- Width of planting area;
- Sand or clay substrata; and
- Existing vegetation.

Although not all eroding tidal banks can be stabilized with vegetation—the more severely eroding ones requiring engineering structures—vegetation is preferred where possible because it is less expensive to install. The objective of vegetative beach treatment is to reduce or eliminate the energy of waves striking the eroding bank. The grass gradually holds material moved in and out by wave action, building up a marsh area or vegetated zone, which protects the banks. It has been determined that successful tidal bank stabilization results when adapted plants are used within a specified set of shoreline characteristics.

Cluster R. Belcher,
manager, Cape May Plant Materials Center, SCS, Cape May Court House, N.J.

W. Curtis Sharp,
plant materials specialist, Northeast Technical Service Center, SCS, Broomall, Pa.

Study Examines Potential Wildlife Forage

Dwindling antelope and sage grouse populations could make a comeback in northern New Mexico—and other areas—if all goes well with a Soil Conservation Service-Bureau of Land Management (BLM) study.

The study, which was the brainchild of Lee Pattison, SCS district conservationist in Taos, N. Mex., and Ben Kuykendall, BLM wildlife biologist in Taos, hopes to find out which species of forbs and shrubs can survive in the Taos area. The species are thought to be palatable to wildlife, particularly antelope and sage grouse.

Once these factors are determined, the appropriate forbs and shrubs will be planted during regular range reseedings. This will result in a forage that is appetizing to both livestock and wildlife.

Pattison and Kuykendall planted 11, 1-acre test plots on 5 different range sites in mid-October. The plots, which are on BLM land, are fenced to protect them from grazing animals.

"We are testing nine different types of forbs," Pattison said. These include rough menodora, Palmer penstemon, 'Bandera' Rocky Mountain penstemon, small burnet, Rocky Mountain zinnia, Maximilian sunflower, sulfurflower buckwheat, globemallow, and prostrate kochia.

Shrubs being examined include antelope bitterbrush, desert bitterbrush, apacheplume, cliffrose, 'Bighorn' skunkbush sumac, and fourwing saltbush. Three grasses also are being tested: sideoats grama, 'Hachita' blue grama, and Indian ricegrass.

About 80 percent of the seeds planted were from various SCS plant materials centers throughout the West; the remainder were from commercial dealers. Bob Bruce, SCS State woodland specialist in Albuquerque, was instrumental in obtaining the seeds.

Except for the seeds that were furnished by SCS (this includes all those from the plant materials centers), the entire cost of the study—about $2,500—was paid for by BLM.

"We should be able to start making some evaluations this spring when the plants come up," Pattison explained, "although it may be several more years before we can draw any final conclusions."

The information gleaned from the study would be applicable to other parts of the country with ecosystems similar to the Taos area.

Martha J. Newton,
speechwriter, Information and Public Affairs, SCS, Washington, D.C.

Windbreak Research to Protect Vegetable Crops

The Soil Conservation Service and the Freeborn County Soil and Water Conservation District in southern Minnesota are assisting the University of Minnesota with a research project to determine which species of trees for windbreaks are best adapted to organic soils.

The research will be of special interest to farmers in the area who plant specialty vegetable crops, such as onions, carrots, and potatoes, which have a shallow root structure. These crops are easily uprooted because the soil is highly susceptible to wind erosion. Windbreak trees adapted to the area are needed to protect these crops.

Wind erosion rates in the area have been about 7 tons per acre during the past year, according to Bob App, SCS district conservationist for Freeborn County. The acceptable erosion rate on organic soil—that is, the rate at which soil regenerates naturally—is about 2 tons per acre per year. Organic soil is formed from decayed plant materials, and is much lighter than heavier mineral soils, which developed from rock particles.

"Blowing soil literally destroys vegetable crops," explained Willis Reynen, a local farmer. "A 35- to 40-mile-per-hour wind will blow young carrots right out of the ground."

The research is being conducted by Harold Scholten, University of Minnesota Extension Forester. Sixteen species of trees were planted as a windbreak on the property line between Reynen's land and his neighbor's. The species include northern whitecedar, Siberian larch, ash, Norway spruce, nannyberry, honeysuckle, alpine currant, Allegany serviceberry, arrowwood, lilac, dogwood, buckthorn, and caragana.

"Basically, we don't know what species of trees will adapt to organic soils," App said. "By planting 16 different species, research data will be available on which ones adapt best." App believes the research will have statewide application for farmers who plant specialty vegetable crops in organic soil.

The agencies will be analyzing the survival rates of the trees; erosion control rates; growth factors, such as height, width, and rate; and susceptibility to herbicides.

Kate Brady,
public information specialist trainee, SCS, St. Paul, Minn.

Tom Gahm,
public information officer, SCS, St. Paul, Minn.

Changes in Windbreak Design Increase Flexibility, Bring Other Benefits

Farmers and ranchers now have more flexibility in planting trees around farmsteads and feedlots after recent changes in the Soil Conservation Service windbreak design.

According to Keith Ticknor, SCS forester for Nebraska, the changes include an option for a twin-row, high-density windbreak; reduction in the distance a windbreak can be planted from the area to be protected; and use of herbicides in site preparation.

"The twin-row, high-density windbreaks will provide several benefits," explained Ticknor. "For instance, if a landowner plants three of the double-tree rows, the land used will be about the same as that used for a traditional, four-row, normally spaced windbreak. The twin-row windbreaks will grow denser sooner providing a quicker barrier against the wind; snow will fall between the rows rather than on the trees, which will prevent broken trees; and spacing between the rows will be wide enough to farm."

Sid Dronen, SCS forester in South Dakota, agrees. He said that the new twin-row, high-density windbreak promotes faster height growth. Research shows that green ash, Siberian elm, and ponderosa pine make faster growth when planted in narrow, 8-foot rows than they do in 24-foot rows.

"With this new design, the windbreak planting is made up of three to four sets of twin, closely spaced rows," explained Dronen. "A 6-foot space is left between the rows and spacing between the trees in the row is from 5 to 8 feet. .

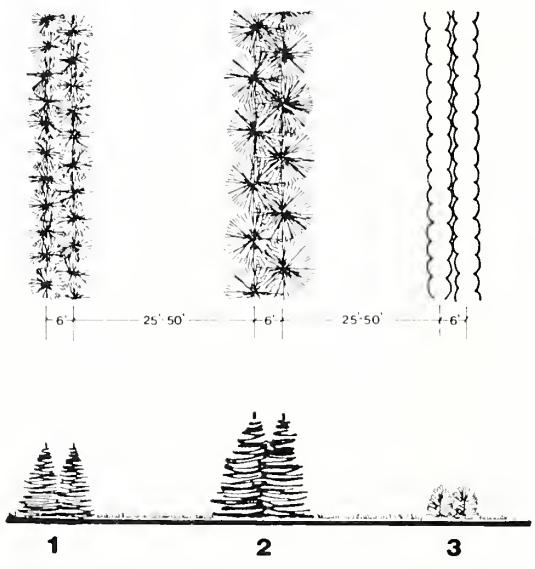
"Besides promoting faster height growth," Dronen said, "the number of years necessary for inrow weed control is reduced because of the earlier canopy closure. Fast-growing species, like Siberian elm, should shade the ground in 3 to 5 years. It will take green ash from 5 to 8 years to close canopy, and the slower-growing conifers should close in 8 to 12 years."

Dronen recommends that 35 to 50 feet needs to be left between each set of rows. This strip should be cultivated for the life of the planting, but it is wide enough to use large cultivators for weed control.

Ticknor said that herbicides instead of disking can now be used to prepare a site for tree plantings. The herbicide will kill any growth but leave the cover for erosion control. Without disking there will also be more moisture in the soil for the new trees.

Another change in Nebraska, according to Ticknor, is the distance a windbreak can be planted from the area to be protected. Previous SCS standards recommended leaving 100 feet open from the protected area to the closest row of trees. Ongoing SCS studies indicated that most of the snow knocked down by a windbreak is trapped in the tree rows and not the open area, so the 100-foot limit has been eliminated.

As a result of this change, addi-



A bird's-eye view (top) and a ground-level view of the new windbreak design show a 6-foot space between rows and 25 to 50 feet between each set of rows. Row 1 could be cedar trees, row 2 pine trees, and row 3 shrubs or broadleaf trees. This windbreak design will take about the same amount of land as a traditional, four-row, normally spaced windbreak.

tional rows of trees or ornamental plantings can be placed closer to the protected areas than was recommended in the past.

Dronen said that wind tunnel studies show that there is very little difference in the protection provided by the new twin-row, high-density plantings and the conventional multiple-row windbreak. Three sets of twin-rows will provide essentially the same protection as a seven-row, conventional belt, Dronen said. But, for added wildlife benefits, the fourth set is needed. He suggests junipers, spruce, or shrubs as good species selections for the fourth set.

"This design offers a lot of flexibility in species selection, depending on the purpose of the windbreak," Dronen explained. "A fast-growing species in the windward rows will give early snow protection, while a fast-growing species on the inside will give the earliest and best wind protection. Regardless of what species is chosen, the same species should be used in each set of twin-rows.

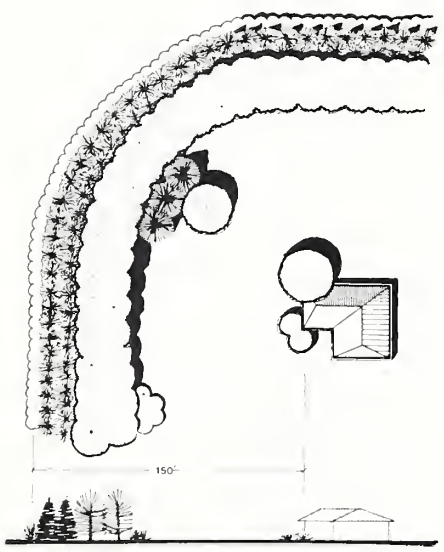
"Looking several years ahead," Dronen continued, "the wide space between the sets of trees will add to the ease of replacing dead rows. The area can be replanted without removing any of the dead trees until after the new rows can provide some protection."

"Farmers and ranchers can get cost sharing to help pay for the trees in a windbreak," Ticknor advised, "and the new twin-row windbreaks qualify. The herbicide may also be cost shared if it's listed in the Agricultural Stabilization and Conservation Service's program."

SCS officials have estimated that people could easily save 10 to 25 percent of their heating fuel bills by planting windbreaks around their homes.

Pat McGrane,
public information officer, SCS, Lincoln, Nebr.

Joyce S. Watkins,
public information officer, SCS, Huron, S. Dak.



With the new windbreak design, the 100-foot limit in the distance a windbreak can be planted from the area to be protected has been eliminated. Thus additional rows of trees or ornamental plantings can be placed closer to the protected area.

Kansas Establishes Windbreaks with Drip Irrigation

Installation of drip irrigation systems in Kansas has rapidly increased during the past few years, and especially since 1979. While this method of irrigating is not new, its use in Kansas until recently has been limited mostly to orchards and specialty crops. Now it is being used to help establish new windbreaks.

Drip irrigation can be defined as "a system for applying precise amounts of water at specific locations through a network of small-diameter pipes and fixtures to attain optimum plant growth with a minimum amount of water." Another way to say this is: "using the 'eye-dropper' method of applying water as opposed to the 'bucket' approach of flood irrigation."

The main reason for drip irrigating new windbreaks is to increase the survival rate of the trees. Without supplemental water, the survival rate can drop below 50 percent in western Kansas. With irrigation, it can be increased to 90 or 95 percent. Drip irrigation, with its high water use efficiency, results in less pumping and, in turn, reduced energy costs.

Technical assistance in designing drip irrigation systems for windbreaks is available from the Soil Conservation Service working through conservation districts. Cost sharing on windbreak establishment is available in many counties in Kansas under the Great Plains Conservation Program and the Agricultural Conservation Program. In 1980 and 1981, nearly 4,000 windbreaks were established in Kansas

using these programs. About 60 percent of the new windbreaks in western Kansas are using drip irrigation to insure higher survival rates.

Under these programs, the drip irrigation systems are designed, as a minimum, to provide water for the windbreaks during the first 3 years after planting. However, with proper design and reasonable maintenance, these systems can last indefinitely.

The average drip irrigation system for a windbreak is relatively easy to design and install. It consists of the water source and fixtures, the main line, the manifold or submain, and one or more lateral lines with emitters. However, system design can become complicated, especially if several different water sources are tied together into a large system of mains and laterals.

Charles Cheek,
water management specialist, SCS, Salina, Kans.

Illinois Volunteers Restore Land Given to County

Illinois citizens in Bureau County donated land, fence posts, seeds, equipment, and their time, building miles of fences and planting native prairie plants, to help their soil and water conservation district (SWCD) restore and preserve four natural areas, without spending a penny of taxpayers' money.

The four natural areas include three sites given to the SWCD, totaling 270 acres, and one 16½-acre roadside site for which the Illinois Department of Transportation gave the SWCD a permit to restore native vegetation.

In 1974, Mildred McCune gave 120 acres of overgrazed sand prairie to the Bureau County SWCD. In 1976, the University of Illinois donated 80 acres adjacent to the McCune land, including woods and prairie. Local citizens used their own fence posts to build a fence around the 200-acre site, which is called the McCune Sand Prairie.

The original 120-acre land gift had 35 acres of sand dunes exposed by wind erosion, and the SWCD shows these dunes to school groups as an example of the abuse of farmland.

Natural vegetation has since covered 10 acres of the sand dunes and the SWCD has planted additional native grasses and flowers throughout the McCune Sand Prairie. The grasses include big bluestem, little bluestem, prairie cordgrass, switchgrass, sideoats grama, and bluejoint reedgrass. The flowers include prairie dock, compassplant, rattlesnake master, and gayfeather. Citizens searched railroad tracks and roads in Bureau County to get seed for these plants from wild grasses and flowers.

Also in 1974, the Illinois Department of Transportation gave the SWCD a permit to plant native vegetation on a strip of level, fertile land that runs between a State highway and a service road. The strip is 2¼ miles by 70- to 90-feet wide.

To finance the restoration of this land, named Center Prairie, the local chapter of the Optimists' Club grew soybeans and wheat on the land as the SWCD gradually planted native grasses and flowers, such as prairie cordgrass and prairie dock, on a few acres each year. By 1979, the SWCD had planted grasses and flowers on all 16½ acres.

In 1976, the Ross family gave their 63-acre abandoned gravel pit to the SWCD for a wildlife refuge. The pit has about 25 acres of open water left from the gravel excavation, the rest is wooded and has 4 acres cleared for cornfields. The SWCD uses money from selling the corn to pay for seeds and equipment to maintain the area for pheasants, duck, geese, and other wildlife. Wildlife feed on the cornstalks and corn after the harvest. The SWCD also planted autumn-olive, crownvetch, and evergreens to attract wildlife.

In the same year as the Ross gift, John and Winona Hood gave a 7-acre wooded site to the SWCD. This site is part of a larger woodland that is known as Walnut Grove. Local residents remember that their ancestors owned small parcels of land in the Walnut Grove to cut wood for stoves and fireplaces before they switched to coal. Now most of Walnut Grove is farmland, and the Hood site is one of the few places where people can see a beautiful section of woodland that holds memories of times past.

The McCune Sand Prairie, the Center Prairie, and the Walnut Grove woodland are all open to the public, but Walnut Grove visitors need permission from the SWCD. The SWCD leads tours for school groups and interested citizens on these three sites. The Ross wildlife refuge is closed to the public.

The Bureau County Soil and Water Conservation District is preserving woods and prairie for its citizens while it teaches and practices conservation.

Donald L. Comis,
assistant editor, *Soil and Water Conservation News*, SCS, Washington, D.C.

Save Our Soil, Fighting Erosion in West Tennessee

by John T. Harris
and Nancy M. Garlitz

"Save Our Soil" is the battle cry of West Tennessee conservationists. Intense spring and summer rains in that part of the State make the rich loess soil melt and run like sugar—where it is not adequately protected from erosion. And much of the 6.8 million acres making up West Tennessee, which lies between the Tennessee River on the east and the Mississippi River on the west, is not adequately protected. Annual soil losses range from less than 2 tons to more than 200 tons per acre while for most soils a tolerable rate of soil loss, or one that will not reduce long-term productivity, is 5 tons per acre per year.

About 25 years ago, most of the highly erodible soil of West Tennessee's sloping to steep farmland was held in place by hayfields and pastures used for feeding dairy herds and beef cattle. But since then, the 21 counties have begun to grow half of the State's total production of corn, soybeans, and cotton. Land users have planted 3.5 million acres to clean-tilled crops. About 2.3 million of those acres are sloping land. The switch to clean-tilled row crops on West Tennessee's sloping, wind-deposited soil has led to average erosion rates on sloping cropland of between 35 to 40 tons per acre annually.

Not only is the erosion robbing the farmland of its productive potential, but it is also filling up lakes, streams, wetlands, and rivers with sediment. Besides choking waterways, the sediment carries pollutants such as fertilizers and pesticides with it.

The situation seems grim, but it is not hopeless. West Tennessee farmers are working to turn back the tide of devastating erosion and declining water quality. The U.S. Department of Agriculture (USDA), the Tennessee Valley Authority (TVA), and many other State and local agencies are helping them to do it. They call their concerted effort Save Our Soil, or SOS.

The six-phase SOS program officially began on March 22, 1979, when USDA and TVA signed a memorandum of understanding. The program includes: accelerated soil surveys, small resource conservation management demonstration areas, large resource conservation management demonstration areas, resource management conservation demonstration farms, national Agricultural Conservation Program (ACP) projects, and an accelerated information and education program. The Soil Conservation Service has leadership responsibility in three phases: accelerated soil surveys, small resource conservation management demonstration areas, and large resource conservation management demonstration areas.

Accelerated soil surveys are underway in five counties—Chester, Crockett, Lauderdale, Tipton, and Weakley—and surveys for three more counties—Gibson, Haywood,

Unless they are protected from erosion, the loess soils in West Tennessee melt like sugar. Gully erosion like this and other kinds of erosion have made West Tennessee one of the six most serious erosion areas in the country.

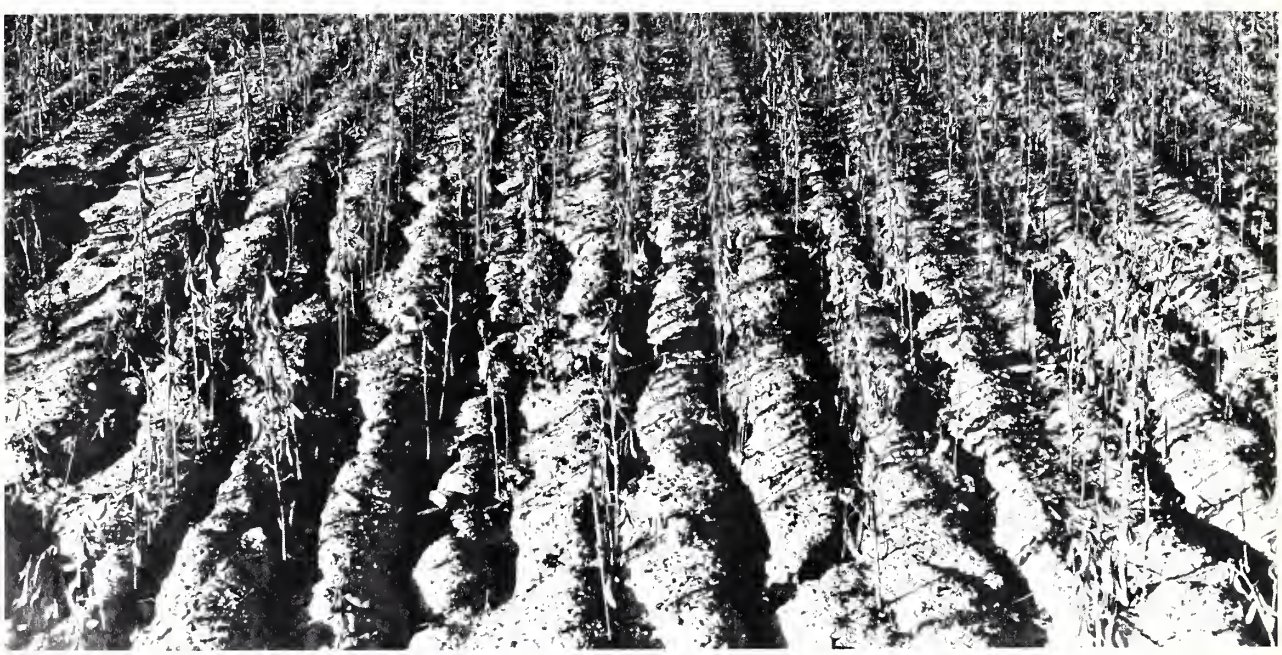
and Hardeman—are scheduled to begin next year. So far, SCS soil scientists have mapped more than 583,000 acres.

Under SCS leadership, small demonstration areas have been set up in six counties. The demonstration areas are all small watershed areas and are designed to show erosion control on a communitywide basis. Once an area is selected, conservation plans are prepared with all landowners in the watershed, resource needs are identified, and community projects get underway. It is estimated that full implementation of the conservation plans for these areas, which total 10,528 acres, will save more than 120,000 tons of soil annually. The project includes monitoring of water quality in the watersheds. The first small demonstration area was Owens Branch in Gibson County—site of the huge farm face-lift demonstration project held on September 15, 1979, to launch the SOS effort.

In July 1980, to reduce pollution caused by sediment and chemicals in Reelfoot Lake, the 153,600-acre Reelfoot Lake drainage area in Lake and Obion Counties, Tenn., and Fulton County, Ky., was selected as a large resource management demonstration area. Besides funding from existing USDA programs, additional funding was approved through the experimental Rural Clean Water Program (RCWP). The large demonstration areas are similar to the small demonstration areas. To date, 43 RCWP contracts, encompassing 6,764 acres, have been signed. In addition, 21 conservation plans on 2,107 acres have been completed. Under the Small Watershed Protection Program, 14 floodwater-retarding structures are planned for the drainage area. Two of these were completed this year, bringing to six the total now completed.

The resource management conservation demonstration farms, under the leadership of the Agricultural Extension Service at the University of Tennessee, have been set up to demonstrate that erosion losses can be reduced without reducing income. SCS estimates that the 85 farms now enrolled were losing about 257,000 tons of soil annually at the beginning of the program. After the entire conservation plan is implemented, the total soil losses will drop to about 68,000 tons, a reduction of 189,000 tons in total soil losses. SCS is providing technical assistance to owners of the demonstration farms in developing conservation plans and installing conservation practices and systems.

The North Fork-Forked Deer River watershed area in Gibson County was selected as a national ACP project in 1979. The watershed encompasses 80,190 acres. The 3-year ACP project is being implemented by long-term agreements based on conservation plans. The



plans are designed to bring erosion rates down to acceptable levels and to reduce pollution entering rivers, lakes, and streams. To date, landowners have signed long-term agreements on 61 farms totaling 10,321 acres.

The accelerated information and education program headed by the University of Tennessee Agricultural Extension Service is being directed at three groups—the general public, farm operators and landowners, and civic and agribusiness groups. Hundreds of tours, news articles, radio and TV programs, and personal contacts have resulted.

Workshops and seminars were used extensively in 1981 to promote conservation tillage and other soil conservation practices. Some 655 farmers attended four area meetings on no-till in West Tennessee, about 2,000 attended a no-till field day at the Milan Experiment Station, and agricultural workers conducted countywide meetings in most counties.

No-till crop production in West Tennessee exceeded 200,000 acres in 1981, up from 43,000 acres in 1978. Estimated yields from no-till farming are comparable to conventional tillage, with the added advantages of saving soil, energy, and labor. Under a no-till system of wheat and soybeans, it is possible to grow two crops a year on most farms, thus increasing profits.

"There is no more appalling example of soil erosion in the United States than on many of the farms in West Tennessee," said Norman A. Berg, SCS chief. "When Assistant Secretary of Agriculture for Natural Resources and Environment John Crowell and I toured the area in July, we saw gully after gully, thousands of acres of sheet and rill erosion, and relentless sedimentation of ponds, creeks, and rivers.

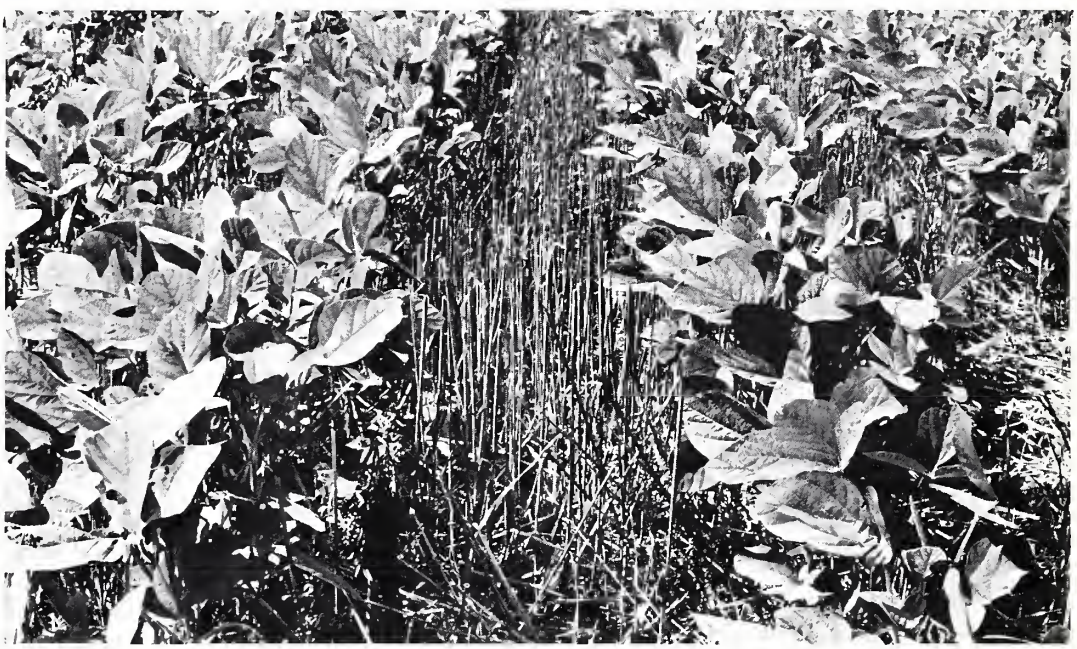
"The extensive erosion control project in these 21 West Tennessee counties is a prime example of our move to target SCS assistance to areas where erosion problems are most critical," he continued. "It is also a big step toward achieving our goal of reducing soil erosion on lands where the current rate of soil loss exceeds tolerable levels for maintaining soil productivity."

"I am convinced that by working together . . . not just among ourselves, but with all our conservation partners . . . we will succeed," said Crowell at the SCS National Conference at Bellevue, Wash., in September. "There is still time to stop the degradation of our soil . . . to prevent flooding . . . and to do all the other things that will help maintain the productive capacity of our land."

John T. Harris,
resource conservationist, SCS, Jackson, Tenn.

Nancy M. Garlitz,
associate editor, *Soil and Water Conservation News*, SCS, Washington, D.C.

At left, rill erosion robs vast acres of unprotected West Tennessee cropland of its topsoil and long-term productivity.
At right, it can be controlled with conservation systems, including such practices as conservation tillage. This crop of no-till soybeans planted in wheat stubble is one way farmers are holding onto their soil.



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Meetings

December	1-3	National Farmers Organization, Indianapolis, Ind.
	1-3	Western Forestry Conference, Sun Valley, Idaho
	7-11	American Society of Agricultural Engineers, Chicago, Ill.
	7-11	Symposium on Surface Mining Hydrology, Sedimentology, and Reclamation, Lexington, Ky.
January	3-8	American Association for the Advancement of Science, Washington, D.C.
	10-14	American Farm Bureau Federation, San Diego, Calif.
	22-28	North American Gamebird Association, Honolulu, Hawaii
February	7-11	National Association of Conservation Districts, Phoenix, Ariz.
	8-12	Society for Range Management, Calgary, Alberta, Canada
	15-18	Land Improvement Contractors of America, Orlando, Fla.
	26-March 1	American Association of School Administrators, New Orleans, La.
	28-March 4	American Institute of Chemical Engineers, Orlando, Fla.

New Publications

The Mineralogy, Chemistry, and Physics of Tropical Soils With Variable Charge Clays

by Goro Uehara
and Gavin Gillman

This book is about tropical soils that are dominated by variable charge minerals, so it differs from other works that assume that the colloidal fraction of soils consists of permanent charge minerals.

The authors have tried not only to identify and apply models to explain the behavior of soils with variable charge clays, but also to provide analytical methods to characterize them on the basis of these models.

They use a soil classification system, developed by USDA's Soil Conservation Service, known as soil taxonomy, which is designed to accommodate all soils of the world.

The book contains many tables, graphs, and equations.

This book is available for $30 from Frederick A. Praeger, Publisher, Westview Press, 5500 Central Avenue, Boulder, Colo. 80301.

Off-Road Vehicle Use: A Management Challenge

Edited by Richard N. L. Andrews and Paul F. Nowak

This is the published proceedings from the conference, "Off-Road Vehicle Use as a Management Challenge" held in 1980.

The general purposes of the conference were to review USDA policies and programs regarding off-road vehicles (ORV's) and to share ORV issues, especially as they relate to agricultural and forestry concerns. USDA has a strong interest in the effective management of ORV's.

These proceedings represent the input of many individuals from diverse backgrounds and perspectives on ORV's.

They contain more than 40 papers, some with photographs, graphs, or tables.

Single copies are available free by writing Dalton Dulac, Recreation Management, Room 4236-S, U.S. Department of Agriculture, Forest Service, Washington, D.C. 20250.

Recent Soil Surveys Published

by the Soil Conservation Service

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Indiana: Putnam County.
Kansas: Franklin County and Rawlins County.
Minnesota: Yellow Medicine County.
Missouri: Cape Girardeau, Mississippi, and Scott Counties, St. Francois County, and Wright County.
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Rhode Island: State of Rhode Island.
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